

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences**

In re Patent Application of

Conf. No.: 5863

BETTONVILLE et al

Atty. Ref.: LCM -4702-38

Serial No. 10/561,796

TC/A.U.: 1782

Filed: December 21, 2005

Examiner: Wood, E.S.

For: POLYETHYLENE PIPE RESINS

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June 28, 2010

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

REPLY BRIEF

The claimed invention provides a pressure pipe resin comprising from 90 to 99.9 wt%, based on the total weight of the resin, of a polyethylene and from 0.1 to 10 wt%, based on the total weight of the blend, of an ionomer. The invention of claim 9 relates to a pressure pipe comprising a resin as defined in claim 1. The sole ground of rejection to be reviewed on appeal is whether claims 1-10 and 12-13 are unpatentable over Dupire *et al.* (EP1201711) (Dupire) in view of Funaki *et al.* (US 2004/0191440) (Funaki).

The Examiner's Answer (Answer) makes two main points regarding Appellants' arguments. First, the Answer argues (page 6) that since the pipes of Funaki have allegedly been improved by use of an ionomer polymer, it would be obvious to incorporate the ionomer polymer of Funaki into the pipe resin of Dupire in order to

obtain similar improvements regardless of the different application. Secondly, the Answer dismisses the distinction between a rubbery polymer containing an ionomer, and “an ionomer” as used in the claimed invention. Each of these points is addressed below.

Regarding the first point, Dupire is silent with regard to the use of “an ionomer” as required by the claimed invention. Funaki describes the use of a “rubbery polymer” as an impact-reducing material (Funaki, para. [0080]) and indicates that the rubbery polymer may contain an ionomer (i.e., may be a rubbery “ionomer polymer” (Funaki, para. [0081])). Moreover, the hoses of Funaki comprise an inner layer made of a fluorocopolymer and an outer layer made of a polyamide resin. Funaki discloses that the rubbery polymer may be optionally added to the polyamide resin to improve its impact properties.

The present invention, on the other hand, claims a pressure pipe resin comprising a polyethylene and an ionomer, and a pressure pipe made from such a resin. As explained in the record of this case, pressure pipes are completely different from the hoses of Funaki, and have completely different (and much tougher) requirements as regards physical properties. In Funaki, it is the impact resistance of a polyamide resin that is being improved by the addition of the rubbery polymer. The resin in Funaki (a polyamide) is not the same as the resin employed in the present invention (a polyethylene), and there is no indication in the cited art as to whether a rubbery polymer would have the same effect on a polyethylene resin as on a polyamide resin or, as discussed below, what effect(s) the addition of a rubbery polymer might have on other properties. Based on this, the skilled artisan, as of the filing date of the

case, would not have been motivated to combine Dupire and Funaki because one relates to polyethylene pipes and the other to multilayer hoses for automobiles. Even if such a combination had been attempted (it is believed such a combination would not have occurred), the presently claimed invention would not have been suggested since neither Funaki nor Dupire, taken singly or in combination, suggests the use of “an ionomer” with “a polyethylene” for pressure pipe resins or pressure pipes fabricated therefrom.

Regarding the Answer’s second point, Funaki (col. 7, para. [0080]) states that “it is preferred to add an impact reducing material to the terminal modified polyamide 12”, and that “The impact reducing material is a rubbery polymer”. In other words, the improvement in impact resistance of the polyamide is achieved not by adding “an ionomer”, but by adding a “**rubbery** polymer” (emphasis added) which may be a rubbery “ionomer polymer”. It cannot be assumed that because the addition of a rubbery polymer to a terminal modified polyamide 12 allegedly improves the impact resistance of the polyamide, addition of “an ionomer” on its own – **not** as part of a rubbery polymer – will improve the impact resistance of a different resin, namely a polyethylene.

A critical property of pressure pipes is their resistance to long term creep. Adding anything to a pressure pipe resin which makes it more “rubbery” is likely to soften the pipe, and that may actually reduce the long term creep resistance. Based on Funaki, the skilled person could not have predicted what the effect would be of adding an ionomer to a polyethylene pressure pipe resin and, in fact, likely would have been

deterred from adding an ionomer because of the possible risk of softening the pipe resin and thereby reducing the long term creep resistance.

In summary, from the cited combination of Dupire and Funaki, the skilled person, as of the filing date of the application, would have understood that Funaki discloses a rubbery polymer containing an ionomer, and would have further understood that addition of the rubbery polymer to a polyamide resin used in fuel hoses improves the impact resistance of the resin, probably by making the polyamide more flexible (in turn probably due to the rubbery nature of the rubbery polymer). The skilled artisan would have seen that there is no indication in the cited combination of references as to what might happen when an ionomer is added not as part of a rubbery polymer to a different resin, namely a polyethylene, and the skilled artisan would not have been able to predict what the outcome of such an addition would be. Absent any such predictability, the claimed resin and pressure pipe fabricated therefrom are not rendered obvious by the combined disclosures of Dupire and Funaki.

Reversal of the outstanding obviousness rejection is respectfully requested.

Respectfully submitted,

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